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EXAMINER	
MERKLING, MATTHEW J	
ART UNIT	**PAPER NUMBER**
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12/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/734,014	NUNAN, JOHN G.	
	Examiner	Art Unit	
	MATTHEW J. MERKLING	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/1/09*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,9,12-17,19,20 and 23-28* is/are pending in the application.

4a) Of the above claim(s) *14-17,19,20,23 and 24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9,12,13 and 25-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/1/09 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 8, 9, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sung et al. (US 5,981,427) in view of Fujitani et al. (US 4,239,656).

Regarding claims 1, 2 and 8, Sung discloses an exhaust treatment device, comprising:

a substrate;

a 1-catalyst layer (col. 10 lines 45-53) deposited on the substrate (col. 8 lines 25-28), the catalyst layer comprising a first catalyst metal (such as Pd, col. 10 lines 33-43) and a

second catalyst metal (such as Rh, col. 10 lines 33-43), as a combined loading on a support forming a mixed layer of said first and said second catalyst material (by indicating that the layers are not 100% separated, the layers are considered to be mixed... see col. 8 lines 36-42 which indicates that a portion of the materials are still intermixed with each other) wherein greater than or equal to about 70 wt% of the first catalyst metal and the second catalyst metal is non-alloyed under alloying conditions, wherein the weight percent is based on a combined weight of the first catalyst metal and the second catalyst metal (see col. 8 lines 36-43 which discloses a most preferable embodiment is where greater than 75% of the first and second noble metal components are separate in the layer, i.e. will not alloy); and

wherein the first catalyst metal and the second catalyst metal are different and individually selected from the group consisting of platinum, palladium, rhodium, iridium, rhenium, ruthenium, and osmium (col. 10 lines 33-43),

wherein the catalyst layer further comprises an aluminum oxide (col. 7 lines 39-47 and an oxygen storage component (see col. 14 lines 6-12),

wherein the oxygen storage component is represented by the formula ($Ce_aZr_bLa_cY_dPr_eO_x$), wherein subscripts a, b, c, d, e, and x, represent atomic fractions, and wherein a+b+c+d+e=1 (see col. 14 lines 6-12, which discloses a composition of oxygen storage material that reads on the claimed composition).

Sung, however, fails to explicitly disclose the aluminum oxide and the storage component have average pore diameters of about 150A to about 1,000A, and

Fujitani also discloses a catalyst for purifying exhaust gases and a carrier for the catalyst (see title).

Fujitani, similar to Sung, teaches a catalyst support (γ-Al_2O_3, see Example 3 or Example 5 of Fujitani) with an oxygen storage component, also similar to Sung (cerium, col. see Example 3 or Example 5 of Fujitani) and an average pore diameter of 400Å (0.04 μm, see Example 3 or Example 5 of Fujitani). Fujitani teaches this in order to provide a catalyst support with a high compressive strength (col. 8 lines 61-68). Fujitani also teaches the pore diameter to the pore volume distribution in Fig. 2 of this catalyst, and further discloses that the pore diameters of the Fujitani invention are distributed over a very narrow range (col. 7 lines 4-8). It is clear to see from Fig. 2, that 50% - 80% of the total volume comes from the pore with diameters in the range of 180Å – 800Å (see curve 1 in Fig. 2). Fujitani teaches this catalyst and structure this as a successful way of removing NO_x, CO, and HC from exhaust gasses (see Table 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the catalyst support with the pore diameter and total pore volume to pore size distribution of Fujitani in the exhaust treatment device of Sung in order to successfully remove NO_x, CO, and HC from exhaust gasses as well as providing a carrier which exhibits a strong compressive strength.

Regarding claims 3 and 4, Sung further discloses the preference for greater than 75% of the first catalyst metal and second catalyst metal to be non-alloyed (see col. 8 lines 36-42). As such, having 90 or 95% of the metals non-alloyed would have been obvious to one of ordinary skill in the art at the time of the invention.

Regarding claims 5 and 6, Sung further discloses the weight ratio of palladium to rhodium is within the claimed ranges (see col. 20 lines 52-56).

Regarding claim 9, Sung further discloses the aluminum oxide comprises gamma aluminum oxide (col. 12 lines 4-9).

Regarding claim 27, Sung discloses an exhaust treatment device, comprising:

a substrate;

a 1-catalyst layer (col. 10 lines 45-53) deposited on the substrate from a slurry (col. 7 lines 1-8), comprising a first catalyst metal (such as Pd, col. 10 lines 33-43) and a second catalyst metal (such as Rh, col. 10 lines 33-43), aluminum oxide (col. 7 lines 39-47) and an oxygen storage material (see col. 14 lines 6-12) to form a wash coat on said substrate, wherein greater than or equal to about 70 wt% of the first catalyst metal and the second catalyst metal in said 1-catalyst layer is non-alloyed under alloying conditions, wherein the weight percent is based on a combined weight of the first catalyst metal and the second catalyst metal (see col. 8 lines 36-43 which discloses a most preferable embodiment is where greater than 75% of the first and second noble metal components are separate in the later, i.e. will not alloy); and

wherein the first catalyst metal and the second catalyst metal together form a mixed layer (by indicating that the layers are not 100% separated, the layers are considered to be mixed… see col. 8 lines 36-42 which indicates that a portion of the materials are still intermixed with each other) and are different and individually selected from the group consisting of platinum, palladium, rhodium, iridium, rhenium, ruthenium, and osmium (as mentioned above),

wherein the oxygen storage component is represented by the formula ($Ce_aZr_bLa_cY_dPr_eO_x$), wherein subscripts a, b, c, d, e, and x, represent atomic fractions, and wherein a+b+c+d+e=1; and *a* is from 0.01 to 0.6 (see col. 14 lines 6-12, which discloses a composition of oxygen storage material and ceria (10-30wt%) that reads on the claimed composition).

Sung, however, fails to explicitly disclose the aluminum oxide and the storage component have average pore diameters of about 150A to about 1,000A, and

Fujitani also discloses a catalyst for purifying exhaust gases and a carrier for the catalyst (see title).

Fujitani, similar to Sung, teaches a catalyst support (γ-Al_2O_3, see Example 3 or Example 5 of Fujitani) with an oxygen storage component, also similar to Sung (cerium, col. see Example 3 or Example 5 of Fujitani) and an average pore diameter of 400Å (0.04 μm, see Example 3 or Example 5 of Fujitani). Fujitani teaches this in order to provide a catalyst support with a high compressive strength (col. 8 lines 61-68). Fujitani also teaches the pore diameter to the pore volume distribution in Fig. 2 of this catalyst, and further discloses that the pore diameters of the Fujitani invention are distributed over a very narrow range (col. 7 lines 4-8). It is clear to see from Fig. 2, that 50% - 80% of the total volume comes from the pore with diameters in the range of 180Å – 800Å (see curve 1 in Fig. 2). Fujitani teaches this catalyst and structure this as a successful way of removing NO_x, CO, and HC from exhaust gasses (see Table 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the catalyst support with the pore diameter and total pore volume to pore

size distribution of Fujitani in the exhaust treatment device of Sung in order to successfully remove NO_x, CO, and HC from exhaust gasses as well as providing a carrier which exhibits a strong compressive strength.

Regarding claim 28, Sung discloses an exhaust treatment device, comprising:

a substrate;

a 1-catalyst layer (col. 10 lines 45-53) deposited from a slurry onto the substrate (col. 8 lines 25-28) to form a washcoated substrate (col. 18 line 66 – col. 19 line 3), the catalyst layer comprising palladium as a first catalyst metal (such as Pd, col. 10 lines 33-43) and rhodium as a second catalyst metal (such as Rh, col. 10 lines 33-43) as a combined loading on a support as a mixed layer of Pd/Rh (by indicating that the layers are not 100% separated, the layers are considered to be mixed… see col. 8 lines 36-42 which indicates that a portion of the materials are still intermixed with each other), wherein greater than or equal to about 70 wt% of the first catalyst metal and the second catalyst metal is non-alloyed under alloying conditions, wherein the weight percent is based on a combined weight of the first catalyst metal and the second catalyst metal (see col. 8 lines 36-43 which discloses a most preferable embodiment is where greater than 75% of the first and second noble metal components are separate in the later, i.e. will not alloy); and

wherein the oxygen storage component is represented by the formula ($Ce_aZr_bLa_cY_dPr_eO_x$), wherein subscripts a, b, c, d, e, and x, represent atomic fractions, and wherein a+b+c+d+e=1; (see col. 14 lines 6-12, which discloses a composition of oxygen storage material that reads on the claimed composition); and

said mixed layer formed from said slurry comprising a palladium salt, a rhodium salt, aluminum oxide and said oxygen storage component (see example 1 in col. 20 which discloses all materials were combined in a slurry prior to washcoating a substrate).

Sung, however, fails to explicitly disclose the aluminum oxide and the storage component have average pore diameters of about 150A to about 1,000A, and

Fujitani also discloses a catalyst for purifying exhaust gases and a carrier for the catalyst (see title).

Fujitani, similar to Sung, teaches a catalyst support (γ-Al_2O_3, see Example 3 or Example 5 of Fujitani) with an oxygen storage component, also similar to Sung (cerium, col. see Example 3 or Example 5 of Fujitani) and an average pore diameter of 400Å (0.04 μm, see Example 3 or Example 5 of Fujitani). Fujitani teaches this in order to provide a catalyst support with a high compressive strength (col. 8 lines 61-68). Fujitani also teaches the pore diameter to the pore volume distribution in Fig. 2 of this catalyst, and further discloses that the pore diameters of the Fujitani invention are distributed over a very narrow range (col. 7 lines 4-8). It is clear to see from Fig. 2, that 50% - 80% of the total volume comes from the pore with diameters in the range of 180Å – 800Å (see curve 1 in Fig. 2). Fujitani teaches this catalyst and structure this as a successful way of removing NO_x, CO, and HC from exhaust gasses (see Table 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the catalyst support with the pore diameter and total pore volume to pore size distribution of Fujitani in the exhaust treatment device of Sung in order to

successfully remove NO_x, CO, and HC from exhaust gasses as well as providing a carrier which exhibits a strong compressive strength.

4. Claims 12 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sung et al. (US 5,981,427) and Fujitani et al. (US 4,239,656) as applied to claim 1 above, and further in view of Anatoly et al. (US 6,387,338).

Regarding claims 12 and 26, modified Sung discloses the use an oxygen storage component, but fails to teach the exact composition of the claimed oxygen storage component.

Anatoly also discloses oxygen storage materials.

Anatoly teaches an oxygen storage component with the composition of $Zr_{0.65}Ce_{0.25}La_{0.04}Y_{0.06}O_{1.95}$ (see Example 5) in order to enhance the phase stability under high temperature oxidizing and reducing conditions (see Brief Description of Fig. 14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the composition of Anatoly in the oxygen storage component of Nunan in order to enhance the phase stability of the oxygen storage component under high temperature oxidizing and reducing conditions which are present in the disclosure of Sung (col. 12 lines 10-19).

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sung et al. (US 5,981,427) and Fujitani et al. (US 4,239,656) as applied to claim 1 above, and further in view of Suzuki et al. (US 6,335,305).

Regarding claim 13, modified Sung discloses a catalyst for purifying exhaust gasses which contains an oxygen storage component (as discussed above), but fails to teach the oxygen storage component has a stable cubic structure.

Suzuki also discloses a catalyst for purifying exhaust gas (see title).

Suzuki teaches an oxygen storage component with a cubic structure in order to maintain the structure even if a large amount of oxygen is discharged and since oxygen moves freely in the cubic structure, it shows excellent oxygen storage ability as compared to other structures (col. 6 lines 18-24).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the cubic structure of the oxygen storage component, as in Suzuki, in the oxygen storage component of modified Sung in order to maintain the structure even if a large amount of oxygen is discharged and since oxygen moves freely in the cubic structure, it shows excellent oxygen storage ability as compared to other structures.

6. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sung et al. (US 5,981,427) in view of Foster (US 5,857,140).

Regarding claim 25, Sung discloses an exhaust treatment device, comprising:

a substrate;

a 1-catalyst layer (col. 10 lines 45-53) deposited on the substrate (col. 8 lines 25-28), the catalyst layer being a mixed layer (by indicating that the layers are not 100% separated, the layers are considered to be mixed… see col. 8 lines 36-42 which indicates that a portion of the materials are still intermixed with each other) comprising a first

catalyst metal (such as Pd, col. 10 lines 33-43) and a second catalyst metal (such as Rh, col. 10 lines 33-43), wherein greater than or equal to about 70 wt% of the first catalyst metal and the second catalyst metal is non-alloyed under alloying conditions, wherein the weight percent is based on a combined weight of the first catalyst metal and the second catalyst metal (see col. 8 lines 36-43 which discloses a most preferable embodiment is where greater than 75% of the first and second noble metal components are separate in the later, i.e. will not alloy); and

wherein the first catalyst metal and the second catalyst metal are different and individually selected from the group consisting of palladium and rhodium (col. 10 lines 33-43),

wherein the catalyst layer further comprises an aluminum oxide (col. 7 lines 39-47 and an oxygen storage component (see col. 14 lines 6-12),

wherein the oxygen storage component is represented by the formula ($Ce_aZr_bLa_cY_dPr_eO_x$), wherein subscripts a, b, c, d, e, and x, represent atomic fractions, and wherein a+b+c+d+e=1; and *a* is from 0.01 to 0.6 (see col. 14 lines 6-12, which discloses a composition of oxygen storage material and ceria (10-30wt%) that reads on the claimed composition).

Sung teaches a catalyst for use in a exhaust treatment device, but fails to teach a retention material disposed around the substrate to form a subassembly and also a housing disposed around the subassembly.

Foster also discloses an exhaust gas treatment device (see Fig. 1)

Foster teaches a retention material (mat, (24)) in order to support the substrate (18) and prevent excessive heat loss (col. 1 line 64 – col. 2 line 5), and also teaches a housing (12) around the substrate and the retention material to improve the durability of the retention material (intumescent material, col. 1 line 64 – col. 2 line 5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add the retention material and housing of Foster, to the exhaust treatment device of Sung in order to support the substrate and prevent excessive heat loss and to improve the durability of the retention material.

Declaration under 37 CFR 1.132

7. The declaration under 37 CFR 1.132 filed 10/1/09 is insufficient to overcome the rejection of all claims based upon 35 USC §103(a) as set forth in the last Office action because:

It refer(s) only to the system described in the above referenced application and not to the individual claims of the application. In other words, there is nothing in the claims that limits the claim to a 1 catalyst layer with a uniform distribution of the metals throughout the layer. Thus, there is no showing that the objective evidence of nonobviousness is commensurate in scope with the claims. See MPEP § 716.

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

Response to Arguments

8. Applicant's arguments filed 10/1/09 have been fully considered but they are not persuasive.

On pages 13-16, Applicant makes the argument that Sung teaches the catalyst metals are loaded on 'different' supports because the supports are different sizes even though they are the same material, and therefore Sung does not teach the limitation that the metals are loaded as "a combined loading on a support forming a mixed layer of said first and said second catalyst material. The examiner respectfully disagrees with this argument. The claim merely states "a support" and makes no reference to material or size of the support. As such, Applicants arguments directed toward the size of the particles that make up the support is unpersuasive since these limitations are not recited in the claims.

In other words, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the support is comprised of particles of equal size) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. MERKLING whose telephone number is (571)272-9813. The examiner can normally be reached on M-F 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. J. M./
Examiner, Art Unit 1795

/Jennifer K. Michener/
Supervisory Patent Examiner, Art Unit 1795